ASI=Arterial stiffness index
SFI=Arterial systolic flow index
SFRI=Arterial systolic flow resistance index
DFI=Arterial diastolic flow index
DFRI=Arterial diastolic flow resistance index
VRI=Vascular Resistance Index
SVRP=Systolic Vascular Resistance Pressure (mmHg)
DVRP=Diastolic Vascular Resistance Pressure (mmHg)
SRI=Systolic Resistive Index
DRI=Diastolic Resistive Index
COI=Cardiac Output Index
BI=Arterial baseline Index for ACI, ASI, SFI, SFRI, DFI, DFRI, VRI, SVRP, DVRP, SRI, DRI and COI
A1=Arterial equilibrium area index=inverse of vascular resistance index=1/VRI
A2=Arterial elastic recoil area index

Thus, the relationship between arterial equilibrium area index and elastic recoil area index is **A1**/**A2**. Further, the higher the value of the VRI the higher the vascular resistance. High values of **A1** (low VRI) with or without stiffness represent arterial stenosis or narrowing. The percentage stenosis or narrowing can be calculated from a baseline **A1** index of the artery in issue, such that: the % Stenosis or narrowing={1−[**A1** (local baseline)/**A1** (at stenosis or narrowing)]}×100. Determination of artery stenosis without stiffness is indicative of inflammation or soft plaque formation whereas artery stenosis with stiffness would indicate hard plaque formation.

Thus, while there has been shown and described, fundamental novel features of the disclosure as applied to various specific embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the apparatus illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the disclosure. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

The invention claimed is:

1. A system for calculating an arterial compliance index for determining the arterial stiffness of an artery of a subject consisting of:

a blood pressure monitoring device configured to measure a systolic blood pressure reading and a diastolic blood pressure reading for the artery of the subject;

a blood flow velocity monitoring device configured to measure a peak-systolic blood flow velocity, wherein the peak-systolic blood flow velocity is a first measure of velocity of blood flowing within the artery of the subject at a peak point of a systolic phase of contraction of the subject's heart muscle, and an end-diastolic blood flow velocity, wherein the end-diastolic blood flow velocity is a second measure of velocity of blood flowing within the artery of the subject at an end point of a diastolic phase of relaxation of the subject's heart muscle; and

a central processing unit configured to calculate the arterial compliance index as a function of the subject's:

(a) systolic blood pressure reading as measured by the blood pressure monitoring device,

(b) diastolic blood pressure reading as measured by the blood pressure monitoring device,

(c) peak-systolic blood flow velocity determined during the systolic phase of contraction of the subject's heart muscle, and

(d) end-diastolic blood flow velocity determined during a period of relaxation of the subject's heart muscle.

2. The system of claim **1**, wherein the central processing unit is configured to calculate the arterial compliance index as a further function of systolic pressure, pulse pressure and a systolic resistive index, wherein the pulse pressure is defined as the difference between the systolic pressure and diastolic pressure and the systolic resistive index is a quotient determined by a proportion of a first part, wherein the first part is the difference between the peak-systolic velocity and end-diastolic velocity, and a second part, wherein the second part is the peak-systolic velocity.

3. The system of claim **1**, wherein the central processing unit is configured to calculate the arterial compliance index as a further function of diastolic pressure, pulse pressure and a diastolic resistive index, wherein the pulse pressure is defined as the difference between the systolic pressure and diastolic pressure and the diastolic resistive index is a quotient determined by a proportion of a first part, wherein the first part is the difference between the peak-systolic velocity and end-diastolic velocity, and a second part, wherein the second part is the end-diastolic velocity.

4. The system of claim **1**, wherein the central processing unit is configured to calculate the arterial compliance index as a further function of diastolic pressure, systolic pressure, end-diastolic velocity and peak-systolic velocity, wherein the arterial compliance index is a quotient determined by a proportion of a first part, wherein the first part is the difference between a first product of the peak-systolic velocity and the diastolic pressure and a second product of the end diastolic velocity and the systolic pressure, and a second part, wherein the second part is the difference between the peak-systolic velocity and end-systolic velocity.

5. The system of claim **1**, wherein the central processing unit is configured to calculate the arterial compliance index as a further function of:

(a) a first area index of the artery, wherein the first area index of the artery is a quotient determined by a proportion of a first part, wherein the first part is the difference in peak-systolic velocity and end-diastolic velocity and a second part, wherein the second part is the difference in systolic pressure and diastolic pressure, and

(b) a second area index of the artery, wherein the second area index of the artery represents the area of the artery that is generating an arterial elastic recoil pressure for continuous flow during the systolic and diastolic phases.

6. The system of claim **1**, wherein the central processing unit is configured to calculate the arterial compliance index as a further function of:

(a) a first area index of the artery, wherein the first area index of the artery is a quotient determined by a proportion of a first part, wherein the first part is the difference in peak-systolic velocity and end-diastolic velocity and a second part, wherein the second part is the difference in systolic pressure and diastolic pressure, and

(b) the stiffness limit of the artery, wherein the stiffness limit of the artery is defined to be at a point where the first area index of the artery is substantially equal to a second area index of the artery, wherein the second area index of the artery represents the area of the artery that is generating an arterial elastic recoil pressure for continuous flow during the systolic and diastolic phases.